CLAIMS

1. A method of receiving data transmissions in a wireless communication system, comprising:

obtaining received symbols for at least one data transmission on at least one primary traffic channel from at least one primary terminal and at least one data transmission on at least one secondary traffic channel from at least one secondary terminal, wherein the at least one primary traffic channel is orthogonal to one another and is not orthogonal to the at least one secondary traffic channel;

processing the received symbols to obtain decoded data for each of the at least one primary terminal;

estimating interference due to the at least one primary terminal;

canceling the interference due to the at least one primary terminal from the received symbols to obtain interference-canceled symbols; and

processing the interference-canceled symbols to obtain decoded data for each of the at least one secondary terminal.

2. The method of claim 1, wherein the wireless communication system is a frequency hopping communication system.

3. The method of claim 2, wherein the at least one primary traffic channel and the at least one secondary traffic channel are each associated with a respective frequency hopping (FH) sequence that indicates a specific one of a plurality of subbands to use for data transmission in each time interval.

4. The method of claim 1, wherein the wireless communication system is a synchronous system.

5. The method of claim 1, wherein the wireless communication system is an asynchronous system.

6. A method of receiving data transmissions at a base station in a wireless frequency hopping (FH) communication system, comprising:

obtaining received symbols for a plurality of subbands;

processing the received symbols to obtain decoded data for each of at least one primary terminal, wherein the at least one primary terminal is assigned at least one primary FH sequence to use for data transmission, and wherein the at least one primary FH sequence is orthogonal to one another;

estimating interference due to the at least one primary terminal;

canceling the interference due to the at least one primary terminal from the received symbols to obtain interference-canceled symbols; and

processing the interference-canceled symbols to obtain decoded data for each of at least one secondary terminal, wherein the at least one secondary terminal is assigned at least one secondary FH sequence to use for data transmission, and wherein the at least one secondary FH sequence is not orthogonal to the at least one primary FH sequence.

7. The method of claim 6, wherein the at least one primary terminal is assigned the at least one primary FH sequence by the base station, and wherein the at least one secondary terminal is assigned the at least one secondary FH sequence by neighboring base stations of the base station.

8. The method of claim 6, wherein each of the at least one secondary terminal is in soft handoff with at least two base stations that include the base station.

9. The method of claim 8, wherein a first secondary terminal among the at least one secondary terminal is in soft handoff with at least two base stations for at least two different sectors of one cell in the system.

10. The method of claim 8, wherein a first secondary terminal among the at least one secondary terminal is in soft handoff with at least two base stations for at least two different cells in the system.

11. The method of claim 8, wherein each of the at least one secondary terminal is assigned a secondary FH sequence by one of the at least two base stations other than the base station.

12. The method of claim 6, wherein the at least one primary terminal include terminals not in soft handoff and communicating with only the base station.

13. The method of claim 12, wherein the at least one primary terminal further include terminals in soft handoff and assigned FH sequences by the base station.

14. The method of claim 6, wherein the at least one primary FH sequence is pseudo-random with respect to the at least one secondary FH sequence.

15. The method of claim 6, wherein the processing the received symbols includes

for each of the at least one primary terminal,

obtaining received symbols on subbands indicated by a primary FH sequence assigned to the primary terminal,

deriving channel estimates for the primary terminal, and

demodulating and decoding the received symbols for the primary terminal to obtain the decoded data for the primary terminal.

16. The method of claim 6, wherein the estimating includes

for each of the at least one primary terminal,

encoding and modulating the decoded data for the primary terminal to obtain data symbols for the primary terminal,

providing the data symbols for the primary terminal on subbands indicated by a primary FH sequence assigned to the primary terminal, and

processing the data symbols for the primary terminal with channel estimates for the primary terminal to obtain interference due to the primary terminal, and

combining the interference due to each of the at least one primary terminal to obtain the interference due to the at least one primary terminal.

17. The method of claim 6, wherein the processing the interference-canceled symbols includes

for each of the at least one secondary terminal,

obtaining interference-canceled symbols on subbands indicated by a secondary FH sequence assigned to the secondary terminal, and

demodulating and decoding the interference-canceled symbols for the secondary terminal to obtain the decoded data for the secondary terminal.

18. The method of claim 6, wherein the wireless communication system is an orthogonal frequency division multiple access (OFDMA) communication system.

19. An apparatus in a wireless frequency hopping (FH) communication system, comprising:

means for obtaining received symbols for a plurality of subbands;

means for processing the received symbols to obtain decoded data for each of at least one primary terminal, wherein the at least one primary terminal is assigned at least one primary FH sequence to use for data transmission, and wherein the at least one primary FH sequence is orthogonal to one another;

means for estimating interference due to the at least one primary terminal;

means for canceling the interference due to the at least one primary terminal from the received symbols to obtain interference-canceled symbols; and

means for processing the interference-canceled symbols to obtain decoded data for each of at least one secondary terminal, wherein the at least one secondary terminal is assigned at least one secondary FH sequence to use for data transmission, and wherein the at least one secondary FH sequence is not orthogonal to the at least one primary FH sequence

20. An apparatus in a wireless frequency hopping (FH) communication system, comprising:

at least one first data processor operative to process received symbols to obtain decoded data for each of at least one primary terminal, wherein the at least one primary terminal is assigned at least one primary FH sequence to use for data transmission, and wherein the at least one primary FH sequence is orthogonal to one another;

an interference estimator operative to estimate interference due to the at least one primary terminal;

an interference canceller operative to cancel the interference due to the at least one primary terminal from the received symbols to obtain interference-canceled symbols; and

at least one second data processor operative to process the interference-canceled symbols to obtain decoded data for each of at least one secondary terminal, wherein the at least one secondary terminal is assigned at least one secondary FH sequence to use for data transmission, and wherein the at least one secondary FH sequence is not orthogonal to the at least one primary FH sequence.

21. The apparatus of claim 20, wherein each of the at least one first data processor is assigned to a respective one of the at least one primary terminal, and wherein the first data processor for each primary terminal includes

a switch operative to obtain received symbols on subbands indicated by a primary FH sequence assigned to the primary terminal,

a channel estimator operative to derive channel estimates for the primary terminal, and

a demodulator and decoder operative to demodulate and decode the received symbols for the primary terminal to obtain the decoded data for the primary terminal.

22. The apparatus of claim 20, wherein the interference estimator includes at least one per-terminal interference estimator each operative to estimate interference due to a respective one of the at least one primary terminal, and wherein the per-terminal interference estimator for each primary terminal includes

an encoder and modulator operative to encode and modulate the decoded data for the primary terminal to obtain data symbols for the primary terminal,

a switch operative to provide the data symbols for the primary terminal on subbands indicated by a primary FH sequence assigned to the primary terminal, and

a channel simulator operative to process the data symbols for the primary terminal with channel estimates for the primary terminal to obtain the interference due to the primary terminal.

23. A processor readable media for storing instructions operable to:

obtain received symbols for a plurality of subbands;

process the received symbols to obtain decoded data for each of at least one primary terminal, wherein the at least one primary terminal is assigned at least one primary frequency hopping (FH) sequence to use for data transmission, and wherein the at least one primary FH sequence is orthogonal to one another;

estimate interference due to the at least one primary terminal;

cancel the interference due to the at least one primary terminal from the received symbols to obtain interference-canceled symbols; and

process the interference-canceled symbols to obtain decoded data for each of at least one secondary terminal, wherein the at least one secondary terminal is assigned at least one secondary FH sequence to use for data transmission, and wherein the at least one secondary FH sequence is not orthogonal to the at least one primary FH sequence.

24. A method of transmitting data from a terminal in a wireless communication system, comprising:

obtaining an assignment of a traffic channel from a first base station;

encoding and modulating data to obtain data symbols; and

processing the data symbols for transmission on the traffic channel to the first base station and to a second base station, wherein traffic channels assigned by the first base station are orthogonal to one another and are not orthogonal to traffic channels assigned by the second base station.

25. The method of claim 24, wherein the transmission from the terminal is received, processed, and canceled by the first base station prior to recovering transmissions from other terminals assigned with other traffic channels not orthogonal to the traffic channel assigned to the terminal.

26. The method of claim 24, wherein transmissions from other terminals assigned with other traffic channels by the second base station are received, processed, and canceled by the second base station prior to recovering the transmission from the terminal.

27. The method of claim 24, wherein the wireless communication system is a frequency hopping communication system.

28. The method of claim 27, wherein the traffic channels assigned by the first base station and the traffic channels assigned by the second base station are each associated with a respective frequency hopping (FH) sequence that indicates a specific one of a plurality of subbands to use for data transmission in each time interval.

29. The method of claim 24, wherein the first and second base stations are for two different sectors of one cell in the system.

30. The method of claim 24, wherein the first and second base stations are for two different cells in the system.

31. A method of transmitting data in a wireless frequency hopping (FH) communication system, comprising:

obtaining an assignment of an FH sequence from a first base station;

encoding and modulating data to obtain data symbols;

providing the data symbols on subbands indicated by the FH sequence; and

processing the data symbols for transmission to the first base station and to a second base station, wherein FH sequences assigned by the first base station are orthogonal to one another and are not orthogonal to FH sequences assigned by the second base station.

32. The method of claim 31, wherein the FH sequences assigned by the first base station are pseudo-random with respect to the FH sequences assigned by the second base station.

33. An apparatus in a wireless frequency hopping (FH) communication system, comprising:

means for obtaining an assignment of an FH sequence from a first base station;

means for encoding and modulating data to obtain data symbols;

means for providing the data symbols on subbands indicated by the FH sequence; and

means for processing the data symbols for transmission to the first base station and to a second base station, wherein FH sequences assigned by the first base station are orthogonal to one another and are not orthogonal to FH sequences assigned by the second base station.

34. An apparatus in a wireless frequency hopping (FH) communication system, comprising:

a controller operative to obtain an assignment of an FH sequence from a first base station;

an encoder and modulator operative to encode and modulate data to obtain data symbols;

a switch operative to provide the data symbols on subbands indicated by the FH sequence; and

an orthogonal frequency division multiplexing (OFDM) modulator operative to process the data symbols for transmission to the first base station and to a second base station, wherein FH sequences assigned by the first base station are orthogonal to one another and are not orthogonal to FH sequences assigned by the second base station.

35. A processor readable media for storing instructions operable to:

obtain an assignment of a frequency hopping (FH) sequence from a first base station;

encode and modulate data to obtain data symbols;

provide the data symbols on subbands indicated by the FH sequence; and

process the data symbols for transmission to the first base station and to a second base station, wherein FH sequences assigned by the first base station are orthogonal to one another and are not orthogonal to FH sequences assigned by the second base station.